Mass and Related Quantities, France, LNE (Laboratoire national de métrologie et d'essais)

Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
Mass	Mass standards	Comparison in air	1	100	mg			0.4 to 0.8	µg	2	95%	No	Service provided by the LNE	Uncertainty scales with measurand level. The volume of the mass standards is known. Approved on 11 October 2005	
Mass	Mass standards	Comparison in air	0.1	1	g			0.8 to 1.6	µg	2	95%	No	Service provided by the LNE	Uncertainty scales with measurand level. The volume of the mass standards is known. Approved on 11 October 2005	
Mass	Mass standards	Comparison in air	1	10	g			1.6 to 6.5	µg	2	95%	No	Service provided by the LNE	Uncertainty scales with measurand level. The volume of the mass standards is known. Approved on 11 October 2005	
Mass	Mass standards	Comparison in air	10	100	g			6.5 to 12	µg	2	95%	No	Service provided by the LNE	Uncertainty scales with measurand level. The volume of the mass standards is known. Approved on 11 October 2005	
Mass	Mass standards	Comparison in air	0.1	1	kg			12 to 30	µg	2	95%	No	Service provided by the LNE	Uncertainty scales with measurand level. The volume of the mass standards is known. Approved on 11 October 2005	
Mass	Mass standards	Comparison in air	1	10	kg			30 to 800	µg	2	95%	No	Service provided by the LNE	Uncertainty scales with measurand level. The volume of the mass standards is known. Approved on 11 October 2005	

Mass and Related Quantities, France, LNE (Laboratoire national de métrologie et d'essais)

Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
Mass	Mass standards	Comparison in air	10	50	kg			0.8 to 10	mg	2	95%	No	Service provided by the LNE	Uncertainty scales with measurand level. The volume of the mass standards is known. Approved on 11 October 2005	
Mass	Mass standards	Comparison in air	50	100	kg			10 to 60	mg	2	95%	No	Service provided by the LNE	Uncertainty scales with measurand level. The volume of the mass standards is known. Approved on 11 October 2005	
Mass	Mass standards	Comparison in air	100	1000	kg			0.06 to 1.5	g	2	95%	No	Service provided by the LNE	Uncertainty scales with measurand level. The volume of the mass standards is known. Approved on 11 October 2005	
Mass	Mass standards	Comparison in air	1000	5000	kg			1.5 to 7	g	2	95%	No	Service provided by the LNE	Uncertainty scales with measurand level. The volume of the mass standards is known. Approved on 11 October 2005	
Volume of solid	Solid density standard, mass: 0.2 kg to 1 kg	Hydrostatic weighing	50	150	cm^3	Reference temperature	20 °C	0.6	mm^3	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	
Volume of solid	Solid density standard, mass: 0.2 kg to 1 kg	Hydrostatic weighing	50	150	cm^3	Reference temperature	10 °C to 30 °C	2	mm^3	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	
Volume of solid	Mass standard: 1 g to 50 g	Hydrostatic weighing	0.1	6.5	cm^3	Reference temperature	20 °C	0.6	mm^3	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	
Volume of solid	Mass standard: 50 g to 500 g	Hydrostatic weighing	6.5	65	cm^3	Reference temperature	20 °C	0.6 to 2	mm^3	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	
Volume of solid	Mass standard: 0.5 kg to 5 kg	Hydrostatic weighing	65	650	cm^3	Reference temperature	20 °C	2 to 20	mm^3	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	

Mass and Related Quantities, France, LNE (Laboratoire national de métrologie et d'essais)

Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
Density of solid	Mass standard (Pt/Ir)	Hydrostatic weighing	21500	21600	kg/m^3	Reference temperature	20 °C	0.6	kg/m^3	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	
Density of solid	Mass standard: 0.001 kg to 0.05 kg	Hydrostatic weighing	7000	9500	kg/m^3	Reference temperature	20 °C	(40.8 - 0.0396/m), m mass in kg	kg/m^3	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	
Density of solid	Mass standard: 0.05 kg to 0.5 kg	Hydrostatic weighing	7000	9500	kg/m^3	Reference temperature	20 °C	(0.1444 + 0.0528/m), m mass in kg	kg/m^3	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	
Density of solid	Mass standard: 0.5 kg to 5 kg	Hydrostatic weighing	7000	9500	kg/m^3	Reference temperature	20 °C	0.25	kg/m^3	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	
Density of solid	Solid sample 100 g	Hydrostatic weighing	2000	9500	kg/m^3	Reference temperature	20 °C	0.4	kg/m^3	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	
Absolute pressure	Vacuum gauges	Gas medium	1E-06	1E-03	Pa			(1E-07 + 5E-02p), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 1.5E-07 Pa to 5E-05 Pa Approved on 11 October 2005	
Absolute pressure	Vacuum gauges	Gas medium	1E-03	1	Pa			(7E-06 + 5E-03p), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 1.2E-05 Pa to 5E-03 Pa Approved on 11 October 2005	
Absolute pressure	Vacuum gauges	Gas medium	1	1E+03	Pa			(4E-03 + 1.3E-03p), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 5.3E-03 Pa to 1.3 Pa Approved on 11 October 2005	
Absolute pressure	Vacuum gauges	Gas medium	1E+03	3.5E+03	Pa			(1 + 1.3E-03p), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 2.3 Pa to 5.6 Pa Approved on 11 October 2005	
Gauge pressure	Pressure gauge	Gas medium	0	1E+03	Pa			(4E-03 + 1.3E-03p), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 4.0E-03 Pa to 1.3 Pa Approved on 11 October 2005	
Gauge pressure	Pressure gauge	Gas medium	1E+03	1E+04	Pa			(1 + 1.3E-03p), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 2.3 Pa to 14 Pa Approved on 11 October 2005	

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Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
Absolute pressure	Pressure balance	Gas medium	3.5E+03	1E+05	Pa			(0.2 + 1.9E-05p), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 2.7E-01 Pa to 2.1 Pa Approved on 11 October 2005	
Absolute pressure	Pressure balance	Gas medium	1E+05	1E+06	Pa			(0.2 + 7E-06p), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 9E-01 Pa to 7.2 Pa Approved on 11 October 2005	
Gauge pressure	Pressure balance	Gas medium	1E+04	1E+06	Pa			(0.1 + 7E-06p), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 1.7E-01 Pa to 7.1 Pa Approved on 11 October 2005	
Gauge pressure	Pressure balance	Gas medium	1E+06	1E+07	Pa			(2.9 + 8E-06p + 9E-14p^2), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 1.1E+01 Pa to 9.2E+01 Pa Approved on 11 October 2005	
Gauge pressure	Pressure balance	Oil medium	2E+05	1E+07	Pa			(5.7 + 8E-06p + 9E-14p^2), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 7.3 Pa to 9.6E+01 Pa Approved on 11 October 2005	
Gauge pressure	Pressure balance	Oil medium	1E+07	2E+08	Pa			(50 + 1E-05p + 1E-13p^2), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 1.6E+02 Pa to 6.1E+03 Pa Approved on 11 October 2005	
Gauge pressure	Pressure balance	Oil medium	2E+08	1E+09	Pa			(120 + 1.5E-05p + 1E-13p^2), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 7.3E+03 Pa to 1.2E+05 Pa Approved on 11 October 2005	
Gauge pressure	Pressure balance	Gas medium	1E+07	2E+07	Pa			(10 + 2.1E-05p), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 2.1E+02 Pa to 4.1E+02 Pa Approved on 11 October 2005	
Gauge pressure	Pressure balance	Gas medium	2E+07	4E+07	Pa			(60 + 3.6E-05p), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 7.8E+02 Pa to 1.5E+03 Pa Approved on 11 October 2005	

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Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
Gauge pressure	Pressure balance	Gas medium	4E+07	8E+07	Pa			(100 + 3.1E-05p), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 1.3E+03 Pa to 2.5E+03 Pa Approved on 11 October 2005	
Differential pressure	Pressure gauge	Gas medium	0	4E+06	Pa	Line pressure, p_{line} and differential pressure, p	2E+05 Pa < p_{line} + p < 4E+06 Pa	(6 + 1.5E-06p_{line} + 2.5E-05p), p_{line} and p in Pa	Pa	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	
Differential pressure	Pressure gauge	Gas medium	0	2E+07	Pa	Line pressure, p_{line} and differential pressure, p	6E+05 Pa < p_{line} + p < 2E+07 Pa	(10 + 1.5E-06p_{line} + 2E-05p), p_{line} and p in Pa	Pa	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	
Differential pressure	Pressure gauge	Gas medium	0	5E+05	Pa	Line pressure, p_{line}	1E+05 Pa< p_{line} <4E+07 Pa	[1.1 + (1E-11p_{line} + 4E-05)p] , p_{line} and p differential pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	
Dynamic pressure	Pressure gauge	Gas medium	2E+04	5E+05	Pa	Frequency	10 Hz to 500 Hz	(600 + 2E-02p), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 1.0E+03 Pa to 1.1E+04 Pa Approved on 11 October 2005	
Dynamic pressure	Pressure gauge	Gas medium	2E+04	5E+05	Pa	Frequency	500 Hz to 5000 Hz	(600 + 4E-02p), p pressure in Pa	Pa	2	95%	No	Service provided by the LNE	Uncertainty values range from 1.4E+03 Pa to 2.1E+04 Pa Approved on 11 October 2005	
Dynamic pressure	Pressure gauge	Gas medium	2E+04	5E+05	Pa	Frequency	1 Hz to 10 Hz	600	Pa	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	

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Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
Force: tension and compression	Force measuring device	Deadweight	5	2000	N			0.0025	%	2	95%	Yes	Service provided by the LNE	Approved on 11 October 2005	
Force: tension and compression	Force measuring device	Deadweight	100	5000	N			0.001	%	2	95%	Yes	Service provided by the LNE	Approved on 11 October 2005	
Force: tension and compression	Force measuring device	Deadweight	1	50	kN			0.001	%	2	95%	Yes	Service provided by the LNE	Approved on 11 October 2005	
Force: tension and compression	Force measuring device	Deadweight	10	500	kN			0.002	%	2	95%	Yes	Service provided by the LNE	Approved on 11 October 2005	
Force: compression	Force measuring device	Build-up system	50	1000	kN			0.02	%	2	95%	Yes	Service provided by the LNE	Approved on 11 October 2005	
Force: tension	Force measuring device	Build-up system	50	1500	kN			0.02	%	2	95%	Yes	Service provided by the LNE	Approved on 11 October 2005	
Force: tension and compression	Force measuring device	Build-up system	100	3000	kN			0.03	%	2	95%	Yes	Service provided by the LNE	Approved on 11 October 2005	
Force: tension and compression	Force measuring device	Build-up system	300	9000	kN			0.05	%	2	95%	Yes	Service provided by the LNE	Approved on 11 October 2005	
Torque	Torque measuring device		1	40	Nm	Mode	clockwise, anticlockwise	(2.0E-04M + 0.005), M torque in Nm	Nm	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	
Torque	Torque measuring device		5	300	Nm	Mode	clockwise, anticlockwise	(2.0E-04M + 0.015), M torque in Nm	Nm	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	
Torque	Torque measuring device		5	2 000	Nm	Mode	clockwise, anticlockwise	(2.0E-04M + 0.04), M torque in Nm	Nm	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	
Torque	Torque measuring device		2	10	kNm	Mode	clockwise, anticlockwise	(2.0E-03M + 2.0), M torque in kNm	Nm	2	95%	No	Service provided by the LNE	Approved on 11 October 2005	
Torque	Torque measuring device		10	200	kNm	Mode	clockwise, anticlockwise	2.0E-03		2	95%	Yes	Service provided by the LNE	Approved on 11 October 2005	

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Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
Kinematic viscosity	Newtonian liquids	Capillary viscometer	0.001	0.005	mm2/s2	Temperature	20 °C	0.15	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Kinematic viscosity	Newtonian liquids	Capillary viscometer	0.005	0.03	mm2/s2	Temperature	20 °C	0.20	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Kinematic viscosity	Newtonian liquids	Capillary viscometer	0.03	0.1	mm2/s2	Temperature	20 °C	0.30	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Kinematic viscosity	Newtonian liquids	Capillary viscometer	0.1	0.3	mm2/s2	Temperature	20 °C	0.40	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Kinematic viscosity	Newtonian liquids	Capillary viscometer	0.3	0.8	mm2/s2	Temperature	20 °C	0.50	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Kinematic viscosity	Newtonian liquids	Capillary viscometer	0.8	3	mm2/s2	Temperature	20 °C	0.60	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	

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Kinematic viscosity	Newtonian liquids	Capillary viscometer	3	100	mm2/s2	Temperature	20 °C	0.70	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Kinematic viscosity	Newtonian liquids	Reference liquid	0.9	3	mm2/s	Temperature	40 °C to 20 °C	0.15	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Dynamic viscosity	Newtonian liquids	Reference liquid	0.8	2.7	mPa s	Temperature	40 °C to 20 °C	0.15	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Kinematic viscosity	Newtonian liquids	Reference liquid	3	18	mm2/s	Temperature	100 °C to 20 °C	0.30	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Dynamic viscosity	Newtonian liquids	Reference liquid	2.7	16	mPa s	Temperature	100 °C to 20 °C	0.30	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	

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Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
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Kinematic viscosity	Newtonian liquids	Reference liquid	18	230	mm2/s	Temperature	100 °C to 20 °C	0.40	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Dynamic viscosity	Newtonian liquids	Reference liquid	16	200	mPa s	Temperature	100 °C to 20 °C	0.40	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Kinematic viscosity	Newtonian liquids	Reference liquid	230	1260	mm2/s	Temperature	100 °C to 20 °C	0.50	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Dynamic viscosity	Newtonian liquids	Reference liquid	200	1140	mPa s	Temperature	100 °C to 20 °C	0.50	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Kinematic viscosity	Newtonian liquids	Reference liquid	1260	14100	mm2/s	Temperature	100 °C to 20 °C	0.55	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Dynamic viscosity	Newtonian liquids	Reference liquid	1140	12500	mPa s	Temperature	100 °C to 20 °C	0.55	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	

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Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
Kinematic viscosity	Newtonian liquids	Reference liquid	14100	138000	mm2/s	Temperature	100 °C to 20 °C	0.65	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Dynamic viscosity	Newtonian liquids	Reference liquid	12500	123300	mPa s	Temperature	100 °C to 20 °C	0.65	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Kinematic viscosity	Newtonian liquids	Viscosity measurement	0.9	3	mm2/s	Temperature	100 °C to 20 °C	0.15	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Kinematic viscosity	Newtonian liquids	Viscosity measurement	3	18	mm2/s	Temperature	100 °C to 20 °C	0.30	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Kinematic viscosity	Newtonian liquids	Viscosity measurement	18	230	mm2/s	Temperature	100 °C to 20 °C	0.40	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Kinematic viscosity	Newtonian liquids	Viscosity measurement	230	1260	mm2/s	Temperature	100 °C to 20 °C	0.50	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	

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Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
Kinematic viscosity	Newtonian liquids	Viscosity measurement	1260	14100	mm2/s	Temperature	100 °C to 20 °C	0.55	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Kinematic viscosity	Newtonian liquids	Viscosity measurement	14100	138000	mm2/s	Temperature	100 °C to 20 °C	0.65	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Dynamic viscosity	Newtonian liquids	Viscosity measurement	0.8	2.7	mPa s	Temperature	20 °C to 70 °C	0.10	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Dynamic viscosity	Newtonian liquids	Viscosity measurement	2.7	16	mPa s	Temperature	20 °C to 70 °C	0.30	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Dynamic viscosity	Newtonian liquids	Viscosity measurement	16	200	mPa s	Temperature	20 °C to 70 °C	0.40	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Dynamic viscosity	Newtonian liquids	Viscosity measurement	200	1140	mPa s	Temperature	20 °C to 70 °C	0.50	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	

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Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
Dynamic viscosity	Newtonian liquids	Viscosity measurement	1140	12500	mPa s	Temperature	20 °C to 70 °C	0.55	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	
Dynamic viscosity	Newtonian liquids	Viscosity measurement	12500	123300	mPa s	Temperature	20 °C to 70 °C	0.65	%	2	95%	Yes	Service provided by the LNE	The uncertainty of the viscosity of water (ISO/TR 3666 (1998), 0.17%) is not taken into account Approved on 11 October 2005	

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Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
Volume flow	Primary standard calibration bench	Volumetric type piston prover	0.0028	1	l/s	Gas	dry air	0.20	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR1
						Temperature	room temperature								
						Pressure	0.1 MPa to 1.7 MPa								
						Pipe size	2 mm to 50 mm								
Mass flowrate	Nozzle	Sonic	0.0022	2.2	kg/s	Gas	natural gas	0.22	%	2	95%	Yes	Service provided by the LNE-LADG	PISCINE test bench Approved on 11 October 2005	FR2
						Temperature	20 °C								
						Pressure	0.6 MPa to 5.5 MPa								
						Pipe size	1.5 mm to 17 mm								
Mass flowrate	Nozzle	Sonic	0.003	30	kg/s	Gas	dry air	0.25	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR3
						Temperature	ambient temperature								
						Pressure	0.1 MPa to 4.5 MPa								
						Pipe size	1.5 mm to 39 mm								
Mass flowrate	Orifice plates, Venturi	Differential pressure	0.003	30	kg/s	Gas	dry air	0.35	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR4
						Temperature	ambient temperature								
						Pressure	0.1 MPa to 4.5 MPa								
						Pipe size	DN 25 - 400								
Mass flowrate	Orifice plates, Venturi	Differential pressure	0.0022	10	kg/s	Gas	natural gas	0.35	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR5
						Temperature	20 °C								
						Pressure	0.2 MPa to 3.5 MPa								

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Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
						Pipe size	DN 50 - 300								
Volume flowrate	Flowmeter and gas meter	Pulse or electrical output	0.0028	0.44	m^3/s	Gas	natural gas	0.30	%	2	95%	Yes	Service provided by the LNE-LADG	PLAT test bench Approved on 11 October 2005	FR6
						Temperature	20 °C								
						Pressure	0.2 MPa to 3.5 MPa								
						Pipe size	DN 50 - 300								
Volume flowrate	Flowmeter and gas meter	Pulse or electrical output	0.003	1	m^3/s	Gas	natural gas	0.30	%	2	95%	Yes	Service provided by the LNE-LADG	COKE test bench Approved on 11 October 2005	FR7
						Temperature	20 °C								
						Pressure	0.2 MPa to 3.5 MPa								
						Pipe size	DN 50 - 300								
Volume flowrate	Flowmeter and gas meter	Pulse or electrical output	0.0022	36	m^3/s	Gas	dry air	0.26	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR8
						Pressure	0.1 MPa to 4.5 MPa								
						Pipe size	DN 25 - 400								
Volume flowrate	Flowmeter and gas meter	Pulse or electrical output	0.0028	1	l/s	Gas	air or inert gas	0.20	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR9
						Temperature	ambient temperature								
						Pressure	0.1 MPa to 1.5 MPa								
						Pipe size	2 mm to 50 mm								
Mass flowrate	Flowmeter (MFM, MFC, LFE), nozzle	Dynamic gravimetric method	0.03	700	mg/s	Gas	nitrogen, synthetic air, argon, helium, oxygen, carbon dioxide, nitrous oxide	0.22 to 0.4	%	2	95%	Yes	Service provided by the LNE-LADG	LNE test bench Approved on 11 October 2005	FR10
						Temperature	ambient temperature								
						Pressure	0.1 MPa to 0.5 MPa								
						Pipe size	any size								

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Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
Liquid dynamic (flowing) volume	Volumetric meters	Pulses, electrical output, digital display	2500	2500	l	Liquid	gasoline	0.052	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR11
						Temperature	5 °C to 40 °C								
						Pressure	0 MPa to 1.5 MPa								
						Flowrate	10 m^3/h to 40 m^3/h								
						Pipe size	up to 200 mm								
Liquid dynamic (flowing) volume	Volumetric meters	Pulses, electrical output, digital display	2500	2500	l	Liquid	gasoline	0.043	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR12
						Temperature	5 °C to 40 °C								
						Pressure	0 MPa to 1.5 MPa								
						Flowrate	40 m^3/h to 600 m^3/h								
						Pipe size	up to 200 mm								
Liquid dynamic (flowing) volume	Volumetric meters	Pulses, electrical output, digital display	2500	2500	l	Liquid	jet-fuel	0.046	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR13
						Temperature	5 °C to 40 °C								
						Pressure	0 MPa to 1.5 MPa								
						Flowrate	10 m^3/h to 40 m^3/h								
						Pipe size	up to 200 mm								
Liquid dynamic (flowing) volume	Volumetric meters	Pulses, electrical output, digital display	2500	2500	l	Liquid	jet-fuel	0.040	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR14
						Temperature	5 °C to 40 °C								
						Pressure	0 MPa to 1.5 MPa								
						Flowrate	40 m^3/h to 600 m^3/h								
						Pipe size	up to 200 mm								

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Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
Liquid dynamic (flowing) volume	Volumetric meters	Pulses, electrical output, digital display	2500	2500	l	Liquid	gas-oil	0.044	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR15
						Temperature	5 °C to 40 °C								
						Pressure	0 MPa to 1.5 MPa								
						Flowrate	10 m^3/h to 40 m^3/h								
						Pipe size	up to 200 mm								
Liquid dynamic (flowing) volume	Volumetric meters	Pulses, electrical output, digital display	2500	2500	l	Liquid	gas-oil	0.038	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR16
						Temperature	5 °C to 40 °C								
						Pressure	0 MPa to 1.5 MPa								
						Flowrate	40 m^3/h to 600 m^3/h								
						Pipe size	up to 200 mm								
Liquid dynamic (flowing) volume	Volumetric meters	Pulses, electrical output, digital display	2500	2500	l	Liquid	crude/oil	0.044	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR17
						Temperature	5 °C to 40 °C								
						Pressure	0 MPa to 1.5 MPa								
						Flowrate	10 m^3/h to 40 m^3/h								
						Pipe size	up to 200 mm								
Liquid dynamic (flowing) volume	Volumetric meters	Pulses, electrical output, digital display	2500	2500	l	Liquid	crude/oil	0.039	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR18
						Temperature	5 °C to 40 °C								
						Pressure	0 MPa to 1.5 MPa								
						Flowrate	40 m^3/h to 600 m^3/h								
						Pipe size	up to 200 mm								

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Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
Liquid dynamic (flowing) volume	Volumetric meters	Pulses, electrical output, digital display	10000	10000	l	Liquid	gasoline	0.047	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR19
						Temperature	5 °C to 40 °C								
						Pressure	0 MPa to 1.5 MPa								
						Flowrate	40 m^3/h to 150 m^3/h								
						Pipe size	up to 400 mm								
Liquid dynamic (flowing) volume	Volumetric meters	Pulses, electrical output, digital display	10000	10000	l	Liquid	gasoline	0.039	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR20
						Temperature	5 °C to 40 °C								
						Pressure	0 MPa to 1.5 MPa								
						Flowrate	150 m^3/h to 2500 m^3/h								
						Pipe size	up to 400 mm								
Liquid dynamic (flowing) volume	Volumetric meters	Pulses, electrical output, digital display	10000	10000	l	Liquid	jet-fuel	0.041	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR21
						Temperature	5 °C to 40 °C								
						Pressure	0 MPa to 1.5 MPa								
						Flowrate	40 m^3/h to 150 m^3/h								
						Pipe size	up to 400 mm								
Liquid dynamic (flowing) volume	Volumetric meters	Pulses, electrical output, digital display	10000	10000	l	Liquid	jet-fuel	0.036	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR22
						Temperature	5 °C to 40 °C								
						Pressure	0 MPa to 1.5 MPa								
						Flowrate	150 m^3/h to 2500 m^3/h								
						Pipe size	up to 400 mm								

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Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
Liquid dynamic (flowing) volume	Volumetric meters	Pulses, electrical output, digital display	10000	10000	l	Liquid	gas-oil	0.038	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR23
						Temperature	5 °C to 40 °C								
						Pressure	0 MPa to 1.5 MPa								
						Flowrate	40 m^3/h to 150 m^3/h								
						Pipe size	up to 400 mm								
Liquid dynamic (flowing) volume	Volumetric meters	Pulses, electrical output, digital display	10000	10000	l	Liquid	gas-oil	0.034	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR24
						Temperature	5 °C to 40 °C								
						Pressure	0 MPa to 1.5 MPa								
						Flowrate	150 m^3/h to 2500 m^3/h								
						Pipe size	up to 400 mm								
Liquid dynamic (flowing) volume	Volumetric meters	Pulses, electrical output, digital display	10000	10000	l	Liquid	crude/oil	0.043	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR25
						Temperature	5 °C to 40 °C								
						Pressure	0 MPa to 1.5 MPa								
						Flowrate	40 m^3/h to 150 m^3/h								
						Pipe size	up to 400 mm								
Liquid dynamic (flowing) volume	Volumetric meters	Pulses, electrical output, digital display	10000	10000	l	Liquid	crude/oil	0.034	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR26
						Temperature	5 °C to 40 °C								
						Pressure	0 MPa to 1.5 MPa								
						Flowrate	150 m^3/h to 2500 m^3/h								
						Pipe size	up to 400 mm								

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Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
Mass flowrate	Any flow measurement instrument or flow device	Various type of device, e.g. Coriolis type flowmeters	8	36 000	kg h^{-1}	Liquid	water	0.30	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR27
						Temperature	15 °C to 30 °C								
						Gauge pressure	0.1 MPa to 0.3 MPa								
						Pipe size	DN 2 to DN 100								
Mass flowrate	Any flow measurement instrument or flow device	Various type of device, e.g. Coriolis type flowmeters	8	36 000	kg h^{-1}	Liquid	water	0.30	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR28
						Temperature	30 °C to 90 °C								
						Gauge pressure	0.1 MPa to 0.3 MPa								
						Pipe size	DN 2 to DN 100								
Volume flowrate	Any flow measurement instrument or flow device	Various type of device, e.g. electromagnetic, ultrasonic and mechanical flowmeters	0.008	36	$m^3 h^{-1}$	Liquid	water	0.30	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR29
						Temperature	15 °C to 30 °C								
						Gauge pressure	0.1 MPa to 0.3 MPa								
						Pipe size	DN 2 to DN 100								
Volume flowrate	Any flow measurement instrument or flow device	Various type of device, e.g. electromagnetic, ultrasonic and mechanical flowmeters	0.008	36	$m^3 h^{-1}$	Liquid	water	0.30	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR30
						Temperature	30 °C to 90 °C								
						Gauge pressure	0.1 MPa to 0.3 MPa								
						Pipe size	DN 2 to DN 100								
Quantity of fluid passed: mass	Any flow measurement instrument or flow device	Various type of device, e.g. Coriolis type flowmeters	8	36 000	kg h^{-1}	Liquid	water	0.02	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR31
						Temperature	15 °C to 30 °C								

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Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Service provider**	**Comments**	**NMI Service Identifier**
						Gauge pressure	0.1 MPa to 0.3 MPa								
						Pipe size	DN 2 to DN 100								
Quantity of fluid passed: mass	Any flow measurement instrument or flow device	Various type of device, e.g. Coriolis type flowmeters	8	36 000	kg h^{-1}	Liquid	water	0.06	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR32
						Temperature	30 °C to 90 °C								
						Gauge pressure	0.1 MPa to 0.3 MPa								
						Pipe size	DN 2 to DN 100								
Quantity of fluid passed: volume	Any flow measurement instrument or flow device	Various type of device, e.g. electromagnetic, ultrasonic and mechanical meters	0.008	36	$m^3 h^{-1}$	Liquid	water	0.08	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR33
						Temperature	15 °C to 30 °C								
						Gauge pressure	0.1 MPa to 0.3 MPa								
						Pipe size	DN 2 to DN 100								
Quantity of fluid passed: volume	Any flow measurement instrument or flow device	Various type of device, e.g. electromagnetic, ultrasonic and mechanical meters	0.008	36	$m^3 h^{-1}$	Liquid	water	0.08	%	2	95%	Yes	Service provided by the LNE-LADG	Approved on 11 October 2005	FR34
						Temperature	30 °C to 90 °C								
						Gauge pressure	0.1 MPa to 0.3 MPa								
						Pipe size	DN 2 to DN 100								

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